

## ABSTRACT OF THE DISCLOSURE

In a method for measuring absorption and reduced scattering coefficients of a multiple scattering medium, a coherent light beam is outputted. The coherent light beam includes linear polarized P and S wave components having mutually orthogonal polarizations and frequencies  $\omega_p$  and  $\omega_s$ , respectively. Then, the coherent light beam is split into a signal beam and a reference beam, which include the P wave and S wave components, respectively. The signal beam is subsequently projected into the medium. Optical interference signals of the reference beam and the signal beam penetrating the medium are respectively detected and converted into heterodyne interference electrical signals. Thereafter, the two heterodyne interference electrical signals are compared to obtain amplitude attenuation and phase delay of the signal beam penetrating the medium, from which the absorption and reduced scattering coefficients of the medium at a position where the signal beam penetrated the medium are inferred.